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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/616,262	07/09/2003	Yue Yun Wang	29766-71993	9866
30450	7590	11/07/2005	EXAMINER	
CUMMINS, INC. 11 SOUTH MERIDIAN INDIANAPOLIS, IN 46204			WASHBURN, DOUGLAS N	
			ART UNIT	PAPER NUMBER
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DATE MAILED: 11/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/616,262	Applicant(s) WANG ET AL.	
	Examiner Douglas N. Washburn	Art Unit 2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 November 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 4-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 4-6, 9, 10, 15, 16 and 18 is/are rejected.
- 7) ☒ Claim(s) 7, 8, 11-14, 17 and 19-22 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 November 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>29 July 2003</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Drawings***

1 The drawings were received on 29 November 2004. These drawings fail to comply with 37 CFR 1.84.

## **INFORMATION ON HOW TO EFFECT DRAWING CHANGES**

### **Replacement Drawing Sheets**

Drawing changes must be made by presenting replacement sheets which incorporate the desired changes and which comply with 37 CFR 1.84. An explanation of the changes made must be presented either in the drawing amendments section, or remarks, section of the amendment paper. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). A replacement sheet must include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of the amended drawing(s) must not be labeled as "amended." If the changes to the drawing figure(s) are not accepted by the examiner, applicant will be notified of any required corrective action in the next Office action. No further drawing submission will be required, unless applicant is notified.

Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and within the top margin.

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### **Annotated Drawing Sheets**

A marked-up copy of any amended drawing figure, including annotations indicating the changes made, may be submitted or required by the examiner. The annotated drawing sheet(s) must be clearly labeled as "Annotated Sheet" and must be presented in the amendment or remarks section that explains the change(s) to the drawings.

### **Timing of Corrections**

Applicant is required to submit acceptable corrected drawings within the time period set in the Office action. See 37 CFR 1.85(a). Failure to take corrective action within the set period will result in ABANDONMENT of the application.

If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings MUST be filed within the THREE MONTH shortened statutory period set for reply in the "Notice of Allowability." Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136 for filing the corrected drawings after the mailing of a Notice of Allowability.

### ***Claim Rejections - 35 USC § 102***

2 The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –  
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 4, 9, 10, 16 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Fekete et al. (US 6,298,728) (Hereafter referred to as Fekete).

Fekete teaches:

A system for processing a speed signal indicative of rotational speed of a turbocharger (column 3, lines 45-47) and produced by a turbocharger speed sensor (Sensor; figure 1, element 10) comprising a rate limiter (Bandpass filter; column 3, lines 50-54) having an input receiving a speed signal and an output producing a rate limited speed signal (column 4, lines 19-44) in regard to claim 4;

An envelope filter (Low-pass Filter; column 4, lines 24-26) having an input receiving a rate limited speed signal and an output producing a filtered and rate limited speed signal (figure 1) in regard to claim 4;

A first order filter having a signal input receiving the rate limited speed signal, a filter constant input receiving a filter constant value and a signal output coupled to the input of the envelope filter, the first order filter filtering the rate limited signal and providing a resulting first order filtered and rate limited speed signal to the input of the envelope filter (column 3, lines 49-57; figure 1, elements 13 and 16) in regard to claim 9;

An envelope filter is configured to envelope filter the first order filtered and rate limited speed signal and produce at the output of the envelope filter the filtered and rate limited speed signal in the form of an envelope filtered, first order filtered and rate limited speed signal (column 3, lines 49-57; figure 1, element 16) in regard to claim 10;

Rate limiting a speed signal to produce a rate limited speed signal (column 4, lines 19-44) in regard to claim 16;

Envelope filtering a rate limited speed signal to produce an envelope filtered and rate limited speed signal (column 4, lines 24-26) in regard to claim 16;

And first order filtering a rate limited signal prior to a step of envelope filtering the rate limited speed signal (figure 1) in regard to claim 18.

***Claim Rejections - 35 USC § 103***

3 The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rickman, Jr. (US 4,439,728) (Hereafter referred to as Rickman) in view of Fekete.

Fekete teaches:

A system for processing a speed signal indicative of rotational speed of a turbocharger (column 3, lines 45-47) and produced by a turbocharger speed sensor (Sensor; figure 1, element 10) comprising a rate limiter (Bandpass filter; column 3, lines 50-54) having an input receiving a speed signal and an output producing a rate limited speed signal (column 4, lines 19-44) in regard to claim 4;

And an envelope filter (Low-pass Filter; column 4, lines 24-26) having an input receiving a rate limited speed signal and an output producing a filtered and rate limited speed signal (figure 1) in regard to claim 4.

Fekete is silent regarding

A turbocharger speed sensor is an eddy current sensor in regard to claim 5;

And a rate limiter is a rising rate limiter configured to reduce electromagnetic interference induced spikes in the speed signal in regard to claim 6.

Rickman teaches:

A turbocharger speed sensor is an eddy current sensor (column 4, lines 11-30) in regard to claim 5;

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And a rate limiter is a rising rate limiter configured to reduce electromagnetic interference induced spikes in the speed signal (Tracking Filter; column 3, lines 22-25; figure 1, element 32) in regard to claim 6.

Regarding claim 5, it would have been obvious to one skilled in the art at the time of the instant invention to modify the teaching of Fekete of a piezoelectric acceleration sensor with the teaching of Rickman of a turbocharger speed sensor is an eddy current sensor because known arrangements for detecting rotational turbocharger speed were based on optical and inductive processes.

Regarding claim 6, it would have been obvious to one skilled in the art at the time of the instant invention to modify the teaching of Fekete of a bandpass filter with the teaching of Rickman of a tracking filter because the interfering parts (noise) would have been filtered out so that a useful signal clearly would have differed from the measured signal, representing rotational speed of a turbocharger shaft.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brackney et al. (US 6,408,834) (Hereafter referred to as Brackney) in view of Fekete.

Fekete teaches:

A system for processing a speed signal indicative of rotational speed of a turbocharger (column 3, lines 45-47) and produced by a turbocharger speed sensor (Sensor; figure 1, element 10) comprising a rate limiter (Bandpass filter; column 3, lines 50-54) having an input receiving a speed signal and an output producing a rate limited speed signal (column 4, lines 19-44) in regard to claim 4;

And an envelope filter (Low-pass Filter; column 4, lines 24-26) having an input receiving a rate limited speed signal and an output producing a filtered and rate limited speed signal (figure 1) in regard to claim 4.

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Fekete is silent regarding:

A swallowing capacity control mechanism responsive to a control signal to vary a swallowing capacity of a turbocharger in regard to claim 15;

And a controller producing a control signal as a function of a filtered and rate limited speed signal and a target speed value in regard to claim 15.

Brackney teaches:

A swallowing capacity control mechanism responsive to a control signal to vary a swallowing capacity of the turbocharger (column 4, lines 56 et seq; column 5, lines 1-26) in regard to claim 15;

A controller (Engine Controller; column 3, lines 17-31); figure 2 element 56) producing the control signal as a function of the filtered and rate limited speed signal and a target speed value in regard to claim 15;

Regarding claim 15, it would have been obvious to one skilled in the art at the time of the instant invention to modify the teaching of Fekete of a bandpass filter with the teaching of Brackney of an exhaust gas recirculation (EGR) flow controller because an EGR flow controller output would have produced a variable geometry turbocharger signal (VGT) that would have been used to control a swallowing capacity and/or efficiency of a turbocharger using known techniques via a VGT output signal.

Regarding claim 15, it would have been obvious to one skilled in the art at the time of the instant invention to modify the teaching of Fekete of a bandpass filter with the teaching of Brackney of a controlling a swallowing capacity because an EGR control strategy wherein EGR and VGT control parameters would have been controlled individually and independently to provide better and more consistent control of EGR and fresh air flow, and thus greater control over resulting mass charge flow.



***Allowable Subject Matter***

4 Claims 7, 8, 11-14, 17 and 19-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for indicating allowability:

Claim 7 recites, in part, "the rising rate limiter is configured to sample the speed signal and bound an upper value of the rate limited speed signal as a sum of a preceding speed signal sample value and a rate limit value if a difference between a current speed signal sample value and the preceding speed signal sample value exceeds a rate limit threshold". This feature in combination with the remaining claimed structure avoids the prior art of record.

Claim 8 recites, in part, "second stage rising rate limiter configured to sample the first rate limited speed signal and bound an upper value of the second rate limited speed signal as a sum of a preceding first rate limited speed signal sample value and the rate limit value if a difference between a current first rate limited speed signal sample value and the preceding first rate limited speed signal sample value exceeds the rate limit threshold". This feature in combination with the remaining claimed structure avoids the prior art of record.

Claim 11 recites, in part, "a buffer of predefined size N defining the input of the envelope filter and having as an output a moving window having a window size defined by the N size of the buffer with N-1 overlap". This feature in combination with the remaining claimed structure avoids the prior art of record.

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Claim 12 recites, in part, "A non-linear envelope filter having an input receiving the first order filtered and rate limited speed signal and an output producing the filtered and rate limited speed signal in the form of a non-linear envelope filtered, first order filtered and rate limited speed signal". This feature in combination with the remaining claimed structure avoids the prior art of record.

Claim 13 recites, in part, "the envelope filter producing as a current value of the filtered and rate limited speed signal a sum of the previous filtered and rate limited speed signal value and a product of the difference value and a small filter value if the current rate limited speed signal sample value is greater than the previous filtered and rate limited speed signal value, and to otherwise produce as the current value of the filtered and rate limited speed signal a sum of the previous filtered and rate limited speed signal value and a product of the difference value and a large filter value". This feature in combination with the remaining claimed structure avoids the prior art of record.

Claim 14 recites, in part, "envelope filter is further configured to compute the small filter value as a difference between one and a fractional small filter coefficient value, and to compute the large filter value as a difference between one and a fractional large filter coefficient value". This feature in combination with the remaining claimed structure avoids the prior art of record.

Claim 17 recites, in part, "bounding an upper value of the rate limited speed signal as a sum of a preceding speed signal sample value and a rate limit value if a difference between a current speed signal sample value and the preceding speed signal sample value exceeds a rate limit threshold". This feature in combination with the remaining claimed structure avoids the prior art of record.

Claim 19 recites, in part, "selecting as the envelope filtered and rate limited signal a maximum value of the rate limited speed signal values contained within the buffer". This feature in combination with the remaining claimed structure avoids the prior art of record.

Claim 20 recites, in part, "producing as a current value of the filtered and rate limited speed signal a sum of the previous filtered and rate limited speed signal value and a product of the difference value and a small filter value if the current rate limited speed signal sample value is greater than the previous filtered and rate limited speed signal value, and otherwise producing as the current value of the filtered and rate limited speed signal a sum of the previous filtered and rate limited speed signal value and a product of the difference value and a large filter value". This feature in combination with the remaining claimed structure avoids the prior art of record.

Claim 21 recites, in part, "computing the small filter value as a difference between one and a fractional small filter coefficient value; computing the large filter value as a difference between one and a fractional large filter coefficient value". This feature in combination with the remaining claimed structure avoids the prior art of record.

Claim 22 recites, in part, "controlling a swallowing capacity of the turbocharger as a function of the error signal". This feature in combination with the remaining claimed structure avoids the prior art of record.

It is these limitations, which are not found, taught or suggested in the prior art of record, and are recited in the claimed combination that makes these claims allowable over the prior art.

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Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***


5 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas N. Washburn whose telephone number is (571) 272-2284. The examiner can normally be reached on Monday through Thursday 6:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DNW

  
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